9. between() method

This method is used to filter a DataFrame or a Series by selecting rows where the values fall within a specified range.

Syntax:

```
SeriesName.between(left, right, inclusive='both')
```

- `left` : Lower boundary of the range
- `right` : Upper boundary of the range
- `inclusive` : Indicate whether to include the boundary values.
  Values,
  1. both
  2. neither
  3. left
  4. right

> **Default values of "inclusive" parameter**
>
> The `between()` method in pandas is inclusive of both the left and right boundaries by default(`both`).
> This means that the method will include the boundary values in the filtered results unless specified otherwise.

Ex: Filtering a Series

```
import pandas as pd
s = pd.Series([10, 20, 30, 40, 50])
```

1. Filter this series for values between 20 and 40.

```
5   filtered_s = s[s.between(20, 40)]
6   print(filtered_s)
```

```
PROBLEMS  OUTPUT  TERMINAL  ···
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals>
1    20
2    30
3    40
dtype: int64
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals>
```

2. Filter this Series for for values between 20 and 50, excluding both ends.

```
5   filtered_s = s[s.between(20, 50, inclusive='neither')]
6   print(filtered_s)
```

```
PROBLEMS  OUTPUT  TERMINAL  ···  powershell
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals> python mai
2    30
3    40
dtype: int64
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals>
```

Ex: Filtering a DataFrame

```
import pandas as pd

df = pd.DataFrame({
    'A': [10, 20, 30, 40, 50],
    'B': [5, 15, 25, 35, 45]
})
```

1. Filter this DataFrame for values between 20 and 40 in the column 'A'.

```
8   filtered_df = df[df['A'].between(20, 40)]
```

```
PROBLEMS  OUTPUT  TERMINAL  ···
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals>
    A   B
1  20  15
2  30  25
3  40  35
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals>
```

2. Filter this DataFrame for values between 20 and 40, inclusive of left boundary in the column 'A'.

```
filtered_df = df[df['A'].between(20, 40, inclusive='left')]
print(filtered_df)
```

```
PROBLEMS  OUTPUT  TERMINAL  ...  powershell
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals> python main.py
    A   B
1  20  15
2  30  25
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals>
```

Practical Example

This method is useful for filtering date ranges.

```
date_df = pd.DataFrame({
    'Date': pd.date_range('2024-01-01', periods=5, freq='D'),
    'Value': [10, 20, 30, 40, 50]
})

# Using between() to filter dates
start_date = '2024-01-02'
end_date = '2024-01-04'
filtered_date_df = date_df[date_df['Date'].between(start_date, end_date)]
print(filtered_date_df)
```

```
print(date_df)
# Using between() to filter dates
start_date = '2024-01-02'
end_date = '2024-01-04'
filtered_date_df = date_df[date_df['Date'].b
print(filtered_date_df)
```

```
PROBLEMS  OUTPUT  TERMINAL  ...
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals>
        Date  Value
0 2024-01-01     10
1 2024-01-02     20
2 2024-01-03     30
3 2024-01-04     40
4 2024-01-05     50
        Date  Value
1 2024-01-02     20
2 2024-01-03     30
3 2024-01-04     40
PS C:\Users\ranga\Desktop\Pydata Uniconnect\practicals>
```